REMARKS

The Office Action mailed August 26, 2008 has been carefully considered. Reconsideration in view of the following remarks is respectfully requested.

Amendments and New Claims

Claims 1-3 and 7-9 have been amended and new claims 13 and 14 have been added, to more particularly point out the subject matter the Applicants view as their inventions. Applicants submit that these amendments and new claims do not add new matter to the application.

The 35 U.S.C. § 112, Second Paragraph Rejection

Claim 9 was rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In particular, the Examiner objected to the terms "low enough" and "little electrically conductive" as being indefinite. Claim 9 has been amended to remove this language, and Applicants submit that the resulting amended claim 9 is definite and patentable, and that the rejection of claim 9 under 35 U.S.C. § 112 should be withdrawn.

Rejection under 35 U.S.C. § 102

Claims 1-9 and 12 stand rejected under 35 U.S.C. § 102(b) as being allegedly anticipated by EP 0 403 138 (the "'138 application"). This rejection is respectfully traversed.

Referring to the abstract and Figure 1 of the '138 application, the Examiner states that the application discloses an induction melting apparatus "that has induction coils 14 operated by agitation and melting power supply circuits (16,18) for input of melting power at a first frequency for induction heating and a second frequency for inducing turbulence." (p. 6). Therefore, the Examiner states, "the power supply device 36 is a single electrical circuit to control both melting caused by 16 and agitation caused by 18."

However, the '138 application contains no indication or teaching that the power supply device 36 controls both the melting circuit 16 and the agitation circuit 18. To the contrary, the application states that circuits 16 and 18 are "separately powered and regulated" (col. 2, ll. 54-58.) The agitation circuit 18 is powered by a three phase source 20 and controlled by voltage control 24 (col. 3, ll. 1-6). The '138 specification states that the "[m]edium frequency melting power input [from 36] cannot affect the transformer device 26 as the secondary terminals of the latter are effectively in parallel at medium frequency" (col. 3, l. 58-col. 4, l. 3).

Claim 1, as now amended, requires that the first and second components of the variable current are both generated by the same power source. In one particular embodiment, for example, the low frequency is generated directly by the induction generator 22 as imposed by the function generator 20, and the high frequency is also forced by the induction generator as a result of resonance at the circuit's resonance frequency. The '138 application, however, does not teach or disclose this limitation, and instead teaches that the melting and agitation currents are separately powered as discussed above from two separate power sources that do not interfere with each other. According to the M.P.E.P., a claim is anticipated under 35 U.S.C. § 102(a), (b) and (e) only if each and every element as set forth in the claim is found, either expressly or

inherently described, in a single prior art reference.[1] Since the '138 application does not show all the limitations of amended claim 1, Applicants respectfully submit that the 35 U.S.C. § 102(b) rejection of claim 1 be withdrawn.

Furthermore, the claims as amended would not be obvious to one of skill in the art. As discussed above, the '138 reference does not describe each of the elements of claim 1, and supplying these limitations missing from the '138 reference would not be obvious to one of skill in the art. For example, there is nothing within the '138 reference disclosure that would suggest the inventive contribution made by the present inventors. Nor has there been a disclosure within the '138 reference or *Eckert* that would enable the invention of claim 1, given the knowledge in the art at the filing date of the present application.

As to dependent claims 2–12, the argument set forth above is equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

Moreover, the Examiner states with respect to claim 3 that "EP '138 discloses a capacitor (38), and induction generator (36), and a function generator (34)" (p. 4). However, even if the "bridge rectifier device 34" (col. 3, ll. 42-43) can be construed as a "function generator," item 34 is not "configured to impose modulation at the low frequency and to supply a reference current to the induction generator." Rather, the current from item 34 is fed to the variable input power device 36, which generates the heating current at the hither frequency. Item 34 has nothing to do

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[1] Manual of Patent Examining Procedure (MPEP) § 2131. See also *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

with the lower agitation frequency. Therefore, Applicants respectfully submit that the 35 U.S.C. § 102(b) rejection of claim 3 be withdrawn.

With regard to claim 6, which places the agitation frequency in the range of 0.5 to 10 Hz, this range is not disclosed by the '138 application, which states that this frequency is "typically . . . at 50 Hz" (col. 1, ll. 57-58). The 50 Hz range is taught because 50 Hz is the typical frequency for commercial European alternating current. The '138 patent does not contemplate modifying the input frequency of 50 Hz, which is not typically necessary when melting single-phase compositions in the crucible. As taught in the present disclosure, however, other frequencies, such as the range 0.5 to 10 Hz, are often desirable when fusing diphase systems (Spec. p. 15, ll. 6-10). Therefore, Applicants respectfully submit that the 35 U.S.C. § 102(b) rejection of claim 6 be withdrawn.

With regard to amended claims 7 and 8: claim 7 as amended requires the system to comprise one or more fluid conduits for removal of heat from the crucible, this limitation is not disclosed or taught by the '138 application; claim 8 as amended further requires the presence of a resistance heater, which is also not disclosed in the '138 application. Therefore, Applicants respectfully submit that the 35 U.S.C. § 102(b) rejection of claims 7 and 8 be withdrawn.

Rejection under 35 U.S.C. § 103

Claims 10 and 11 stand rejected under 35 U.S.C. § 103(a) as being allegedly unpatentable over the '138 application in view of *Eckert* (US 5,968,223). This rejection is respectfully traversed.

According to the Examiner, "Eckert discloses baffle heaters placed in the crucible to promote heating of the molten metal by both sides of the baffle heaters" (p. 5). However, the baffle heaters of Eckert are not a "control mechanism to control thermal gradients inside the first and second phases," nor are they "a screen or a susceptor." The baffle heaters in Eckert are simply heaters, and are not configured in a way so that they would control thermal gradients. For example, in Figure 1, the baffle 100 is placed at one side of the treatment bay, near the exit at a place and in a configuration where it would actually be expected to simply create and increase, rather than control, thermal gradients at the end of the bay.

In addition, claims 10 and 11 are dependent on independent claim 1, which as amended is patentable for the reasons described above. The arguments above are equally applicable here. The base claims being allowable, the dependent claims must also be allowable.

In view of the foregoing, Applicants respectfully submit that the 35 U.S.C. § 103 rejection of claims 10 and 11 be withdrawn.

Conclusion

In view of the preceding discussion, Applicants respectfully urge that the claims of the present application define patentable subject matter and should be passed to allowance.

If the Examiner believes that a telephone call would help advance prosecution of the present invention, the Examiner is kindly invited to call the undersigned attorney at the number below.

Please charge any additional required fees, including those necessary to obtain extensions of time to render timely the filing of the instant Amendment and/or Reply to Office Action, or credit any overpayment not otherwise credited, to our deposit account No. 50-3557.

Respectfully submitted,
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